UMAKANT MISHRA

Environmental Science Division
Argonne National Laboratory
9700 South Cass Avenue, Bldg. 240-6143
Argonne, IL 60439
Tel: 630-252-1108
Email: umishra@anl.gov

CURRENT RESEARCH INTERESTS

- Improving spatial heterogeneity representation of soil properties in global earth system models.
- Predicting land use and climate change impacts on soil organic carbon pool and greenhouse gas emissions from terrestrial ecosystems.
- Predicting soil properties at regional, national, and global scales using observations, soil forming factors, and geospatial modeling.
- Developing metrics and model benchmarking datasets for Earth System Models.

ACADEMIC PREPARATION

Geological Postdoctoral Fellow **Aug 09 – May 12**
Lawrence Berkeley National Laboratory/University of California Berkeley
Research - Predicting land use change and climate change impacts on soil organic carbon.
Advisors: Dr. William J. Riley and Dr. Margaret Torn

Ph. D., Soil Science **Jan 06 – Jun 09**
The Ohio State University, OH, USA.
Dissertation - "Predicting storage and dynamics of soil organic carbon at a regional scale" with an objective to develop geospatial methodologies to quantify the soil carbon stock at various scales in terrestrial ecosystem.
Advisors: Dr. Rattan Lal, Dr. Brian Slater, Dr. Frank Calhoun, and Dr. Desheng Liu

Master of Science, Physical Land Resources **Sep 02 - Sep 04**
Ghent University, Ghent, Belgium.
Thesis - "Predicting soil properties using GIS based landscape analysis" with an objective to quantify the role of terrain attributes in determining soil properties.
Advisors: Dr. Marc Van Meirvenne, and Dr. Rudi Goossens

Bachelor of Science, Agriculture **Aug 94 – Jul 98**
Tribhuwan University, IAAS, Chitwan, Nepal.

PROFESSIONAL EXPERIENCE

Geospatial Scientist **Apr 15 - present**
Environmental Science Division, Argonne National Laboratory, IL, USA

Research Fellow **Oct 14 - present**
Computation Institute, University of Chicago, IL, USA

Assistant Geospatial Modeler **Jun 12 - Mar15**
Environmental Science Division, Argonne National Laboratory, IL, USA

- Estimating spatial and vertical distributions of soil organic carbon (SOC) stocks of the permafrost-region soils.
- Improving the representation of spatial heterogeneity of soil properties in global earth system models.
- Developing geospatial approaches to quantify the change in soil properties due to anthropogenic and climatic impacts on soil system.
- Developing geospatial datasets and metrics to benchmark biogeochemistry of earth system models.

Geological Postdoctoral Fellow **Aug 09 – May 12**
Earth Sciences Division, Lawrence Berkeley National Laboratory, USA
Energy Biosciences Institute, University of California Berkeley, CA, USA

- Quantifying impacts of climate change on the soils of permafrost region.
- Evaluating the environmental sustainability of cellulosic biofuels.
- Developing new geospatial methodologies to quantify the change in soil organic carbon due to anthropogenic and climatic influences on soil systems.

Graduate Research Associate **Jan 06 – Jun 09**
School of Environment and Natural Resources, OSU, OH, USA.

- Geospatial analysis of soil organic carbon in the Midwest United States (Mathematical modeling, Pedometrics, Spatial statistics, Terrain analysis, Digital soil prediction).
- Land use management impact on SOC pools at various environmental settings.

Assistant Agronomist **Dec 98 – Sep 02**
Department of Agriculture, Nepal.

- Worked as a coordinator and resource person in seed related trainings.
- Worked as a team member in national seed production program.
- Monitored, evaluated and prepared reports of agricultural programs in country.
- Presented the reports of different programs at the regional and national level workshops.
- Lectured on soil status, nutrient management, and agronomic practices to conserve soil properties.

NEWS & RESEARCH HIGHLIGHTS

NEWS RELEASE (05/20/2010)

"Common view of scientists in the discipline is that a single model applicable to different soil landscapes in regional-scale was unlikely to be developed. This new method can play a vital role in improving the prediction ability of soil organic carbon pools on a regional scale" - SSSA

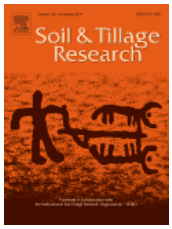
Predicting the Spatial Variation of the Soil Organic Carbon Pool at a Regional Scale, Volume 74, No. 3, Pages 906-914.

Umakant Mishra | Rattan Lal | Desheng Liu | Marc Van Meirvenne

10 Most Cited Papers in the past 3 years (6/19/2012)

Regional Study of No-Till Effects on Carbon Sequestration in the Midwestern United States, Volume 73, No.1, pages 207-216.

Sheila F. Christopher | Rattan Lal | Umakant Mishra



Most cited Soil & Tillage Research articles since 2010 (03/09/2015)

Tillage effects on soil organic carbon storage and dynamics in Corn Belt of Ohio USA, Volume 107, Issue 2, April 2010, Pages 88-96.

Umakant Mishra | David A N Ussiri | Rattan Lal

RESEARCH FUNDING

- Project/Proposal Title: Past and present terrestrial ecosystem development south of Vatnajokull, Iceland
  Role: Co-PI; Support: Funded; Sponsor: The Icelandic Research Fund (RANNIS); Award amount: $157,500; Period covered: 05/1/2012 - 12/31/2014.

- Project/Proposal Title: Developing, improving, and testing methods for predicting spatial and vertical distributions of soil organic carbon at regional scales
  Role: PI; Support: Funded; Sponsor: DOE, contract number DE-AC02-06CH11357; Award amount: $894,000; Period covered: 06/01/2012 - 09/30/2015.

- Project/Proposal Title: Soil carbon response to environmental change
  Role: Co-Investigator; Support: Funded; Sponsor: DOE-Terrestrial Ecosystem Science; Award amount: $3.15 million; Period covered: 10/01/2013 - 09/30/2016.

- Project/Proposal Title: Quantifying feedbacks and uncertainties of biogeochemical processes in Earth System Models
  Role: Co-PI and Technical Co-Manager for Argonne National Laboratory; Support: Funded; Sponsor: DOE- Regional and global climate modeling; Award amount: $2.1 million; Period covered: 10/01/2014 - 9/31/2017.

AWARDS, HONORS, & RECOGNITIONS

2015 **Honorable mention, Editor's citation for excellence in Manuscript review,** Agronomy Journal
2014 **Outstanding Associate Editor Award,** Agronomy Journal
2008 **Gamma Sigma Delta**, The Honor Society of Agriculture, Ohio State University
2008 **Edward J. Ray Travel Award,** The Ohio State University
2002 **Flemish Interuniversity Council (VLIR) Award,** Ghent University, Belgium
1994–1998 **University Merit Scholarship,** Tribhuvan University, Nepal.

STUDENTS & VISITING SCHOLARS

Dr. W.A.U. Vitharana – Senior lecturer, University of Peradeniya, Sri Lanka

PEER-REVIEWED PUBLICATIONS

19. Mishra U., and W.J. Riley. 2015. Scaling impacts on environmental controls and spatial heterogeneity of soil organic carbon stocks. *Biogeosciences* 12:3993-4004, doi:10.5194/bg-12-3993-2015.

18. Drewniak B., **U. Mishra,** J. Song, J. Prell, and V.R. Kotamarthi. 2015. Modeling the impact of agriculture land use and management on U.S. carbon budget. *Biogeosciences* 12:2119–2129, doi:10.5194/bg-12-2119-2015.

17. Hugelius G.H., J. Strauss, Zubrzycki, P. Kuhry, J.W. Harden, E.A.G. Schuur, C-L. Ping, L. Schirrmeister, G. Michaelson, C.D. Koven, J. O'Donnel, B. Elberling, **U. Mishra,** P. Camill, Z. Yu, and J. Palmtag. 2014. Estimated stocks of circumpolar permafrost carbon with quantified uncertainty ranges and identified data gaps. *Biogeosciences,* 11:6573–6593.

16. Mishra U., and W.J. Riley. 2014. Active-layer thickness across Alaska: comparing observation-based estimates with CMIP5 earth system model predictions. *Soil Science Society of America Journal,* 78:894-902.

15. Mishra U., J.D. Jastrow, R. Matamala, G. Hugelius, C.D. Koven, J.W. Harden, C.L. Ping, G.J. Michaelson, Z. Fan, R.M. Miller, A.D. McGuire, C. Tarnocai, P. Kuhry, W.J. Riley, K. Schaefer, E.A.G. Schuur, M.T. Jorgenson, and L.D. Hinzman. 2013. Empirical estimates to reduce modeling uncertainties of soil organic carbon in permafrost regions: a review of recent progress and remaining challenges. *Environmental Research Letters*, 8:035020, doi:10.1088/1748-9326/8/3/035020.

14. Hugelius G.H., C. Tarnocai, J.G. Bockheim, P. Camill, B. Elberling, G. Grosse, J.W. Harden, K. Johnson, T. Jorgenson, C.D. Koven, P. Kuhry, G. Michaelson, **U. Mishra,** J. Palmtag, C-L. Ping, J. O'Donnel, L. Schirrmeister, E.A.G. Schuur, Y. Sheng, L.C. Smith, J. Strauss, and Z. Yu. 2013. A new dataset for estimating organic carbon storage to 3 m depth in soils of the northern circumpolar permafrost region. *Earth System Science Data,* 5:3–13, doi:10.5194/essd-5-3-2013.

13. Nave, L.E., C.W. Swanston, **U. Mishra,** and K.J. Nadelhoffer. 2013. Afforestation effects on soil carbon storage: An assessment for the United States based on meta-analysis, stable isotopes, and a geospatial soil carbon database. *Soil Science Society of America Journal,* 77:1035-1047, doi:10.2136/sssaj2012.0236.

12. Mishra U. 2013. Soil health and climate change: a book review. *Soil Science Society of America Journal,* 77:336-336.

11. Mishra U., M.S. Torn, and K. Fingerman. 2013. Miscanthus biomass productivity within U.S. croplands and its potential impact on soil organic carbon. *Global Change Biology Bioenergy,* 5:391-399, doi: 10.1111/j.1757-1707.2012.01201.x.

10. Mishra U., and W.J. Riley. 2012. Alaskan soil carbon stocks: spatial variability and dependence on environmental factors. *Biogeosciences,* 9:3637-3645.

9. Mishra U., M.S. Torn, S. Ogle, and E. Masanet. 2012. Improving regional soil carbon inventories: combining IPCC carbon inventory method with regression kriging. *Geoderma,* 189-190:288-295.

8. Scown C.D., W. Nazaroff, **U. Mishra,** B. Strogen, A. Lobscheid, T. McKone, and A. Horvath. 2012. Lifecycle greenhouse gas implications of US National Scenarios for cellulosic ethanol production. *Environmental Research Letters,* 7:014011, doi:10.1088/1748-9326/7/1/014011.

7. McKone T., W. Nazaroff, M. Auffhammer, P. Berck, T. Lipman, M. Torn, E. Masanet, A. Lobscheid, N. Santero, **U. Mishra,** A. Barrett, M. Bomberg, K. Fingerman, C. Scown, B. Strogen, and A. Horvath. 2011. Grand Challenges for life-cycle assessment of biofuels. *Environmental Science & Technology,* 45:1751-1756.

6. Mishra U., D. Ussiri, and R. Lal. 2010. Tillage effects on soil carbon storage and dynamics in corn belt of Ohio USA. *Soil & Tillage Research,* 107:88-96.

5. Mishra U., R. Lal, D. Liu, and M. Van Meirvenne. 2010. Predicting the spatial variation of soil organic carbon pool at a regional scale. *Soil Science Society of America Journal,* 74: 906-914.

4. Lamsal S., and **U. Mishra**. 2010. Mapping soil textural fractions across a large watershed in north-east Florida. *Journal of Environmental Management,* 91:1686-1694.

3. Mishra U., R. Lal, B. Slater, F. Calhoun, D. Liu, and M. Van Meirvenne. 2009. Predicting soil organic carbon stock using profile depth distribution functions and ordinary kriging. *Soil Science Society of America Journal,* 73:614-621.

2. Christopher S.F., R. Lal, and **U. Mishra**. 2009. Long-term no-till effects on carbon sequestration in the Midwestern U.S. *Soil Science Society of America Journal,* 73:207-216.

1. Mishra U., D. Clay, T. Trooien, K. Dalsted, D. Malo, and C.G. Carlson. 2008. Assessing the value of using a remote sensing-based evapotranspiration map in site- specific management. *Journal of Plant Nutrition,* 31, 7:1188-1202.

PEER-REVIEWED BOOK CHAPTERS

1. Mishra U., and R. Lal. 2011. Chapter 13, Predictive mapping of soil organic carbon: A case study using geographic weighted regression approach. In: Clay, D. and Shanahan, J. (eds.) "GIS Applications in Agriculture– Nutrient Management for Improved Energy Efficiency". CRC Press. p. 209-233.

2. Mishra U., and W.J. Riley. 2012. Active-layer, permafrost, and whole-profile depth variability of Alaskan soils. In: Minasny, B., Brendan M., and McBratney, A.B. (eds.) "Digital Soil Assessments and Beyond: Proceedings of the 5th Global Workshop on Digital Soil Mapping 2012". CRC Press. p. 83-88.

PUBLICATIONS IN PROGRESS

1. Jiang Y., A.V. Rocha, E.B. Rastetter, G.R. Shaver, **U. Mishra,** Q. Zhuang, and B.L. Kwiatkowski. 2015. C-N-P interactions control climate driven changes in regional patterns of C storage on the North Slope of Alaska. *Landscape Ecology* (under review).

2. Reitsma, K.D., B.H. Dunn, **U. Mishra,** S.A. Clay, T. DeSutter, and D.E. Clay. 2015. Land-use change impact on soil sustainability in a climate and vegetation transition zone. *Agronomy Journal* (under review).

PROFESSIONAL SERVICE

1. Member Editorial Board:

- Associate Editor, Agronomy Journal (2009 – present)
- Associate Editor, Vadose Zone Journal (2014 – present)

2. Journal Reviewer:

∗ Arctic, Antarctic, and Alpine Research ∗ Agriculture, Ecosystems, and Environment *Agronomy Journal *Applied and Environmental Soil Science ∗ Archives of Agronomy & Soil science ∗ Carbon Management ∗ Catena ∗ Climatic Change ∗ Ecosystems ∗ Environmental Monitoring and Assessment ∗ Environmental Research Letters ∗ European Journal of Soil Science ∗ Frontiers in Ecology and the Environment ∗ Geoderma ∗ Geoscientific Model Development * Global Biogeochemical Cycles * Global Change Biology Bioenergy ∗ International Journal of Agronomy ∗ International Journal of Geographical Information Science ∗ Journal of Environmental Management ∗ JGR-Biogeosciences ∗ Northern Journal of Applied Forestry ∗ Nutrient Cycling in Agroecosystems ∗ Pedosphere ∗ Plant & soils ∗ Precision Agriculture ∗ Resources, conservation & Recycling ∗ Sustainable Energy Technologies and Assessments ∗ Soil Science Society of America Journal ∗ Soil & Tillage Research * Vadose Zone Journal * USDA publications * USGS publications

3. Proposal Reviewer:

- National Science Foundation – Geobiology and Low-Temperature Geochemistry program**;** Geography and spatial sciences program

4. Soil Science Research Award Committee:

- Soil Science Society of America, Jan 1, 2015 – Dec 31, 2016.

5. Conference session convener:

- Environmental aspects of bioenergy production- American Geophysical Union Fall meeting 2010.
- Agriculture and land management impacts on soil carbon processes- Soil Science Society of America annual meeting 2014.
- Biofuel-induced land use land cover change and its biogeochemical and biophysical impacts- American Geophysical Union Fall meeting 2015.

6. Chair, EVS Seminar series:

- Chair, Environmental Science Division seminar series, Argonne National Laboratory (2012 - present).

7. Outstanding Student Paper Awards Judge:

- Judge, Outstanding Student Paper Awards, American Geophysical Union (2011, 2012, 2013, 2014).
- Judge, Graduate Student presentations, Soil Science Society of America (2014).

SELECTED INVITED PRESENTATIONS

1. Mishra U., M.S. Torn, W.J. Riley, S. Ogle, and B. Drewniak. 2014. Predicting land use and climate change impacts on soil organic carbon at regional scales, **Soil Science Society of America annual meeting,** Long Beach, CA. 11/05/2014.

2. Mishra U., J. Jastrow, R. Matamala, K. Lagory, and J. Krummel. 2014. Environmental controls and spatial representation of soil properties across Alaska: comparison between geospatial and CMIP5 earth system models, **Korea Polar Research Institute,** Seoul, South Korea. 06/16/2014.

3. Mishra U., J. Jastrow, R. Matamala, K. Lagory, and J. Krummel. 2014. Benchmarking earth system models: A new domain for soil scientists, **USDA-Natural Resource Conservation Services,** Lincoln, NE. 03/18/2014.

4. Mishra U. 2012. Predicting climate and land use change impact on soil organic carbon stocks at regional scales, **American Society of Agronomy annual meeting,** Cincinnati, OH. 10/21/2012.

5. Mishra U., 2012. Quantifying and predicting climatic and anthropogenic impacts on soil organic carbon pool, **University of Sydney,** Sydney, Australia. 04/06/2012.

6. Mishra U., and M.S. Torn. 2011. Rainfed productivity of Miscanthus biomass on US croplands and its potential impact on soil organic carbon, **International Society of Industrial Ecology,** Berkeley, California, USA. 06/09/2011.

7. Mishra U., 2011. Terrestrial carbon sequestration: a local solution to global problems, **Operation Research Society Nepal,** Kathmandu, Nepal. 01/20/2011.

8. Mishra U., 2010. Predicting the storage and dynamics of soil organic carbon in terrestrial ecosystems, **USGS Western Geographic Science Center,** Menlo Park, California. 08/25/2010.

CONTRIBUTED PRESENTATIONS

1. Mishra, U., J.D. Jastrow, R.M. Matamala, Z. Fan, and W.A.U. Vitharana. 2015. ANL TES SFA: Capturing the spatial heterogeneity of soil organic carbon stocks using soil-forming factors, DOE-TES\SBR Joint Investigators Meeting, Apr 28-29, Potomac, MD.

2. Jastrow, J.D., R.M. Matamala, Z. Fan, U. Mishra, C.-L. Ping, and G. Michaelson. 2015. Soil Organic Carbon Stocks and their Distributions across Ice-Wedge Polygons of Arctic Alaska, DOE-TES\SBR Joint Investigators Meeting, Apr 28-29, Potomac, MD.

3. Matamala R.M., J.D. Jastrow, Z. Fan, U. Mishra, C. Liang, F. Calderon, G. Michaelson, and C.-L. Ping. 2015. Characterizing organic matter quality and lability of Alaskan soils using mid infrared spectroscopy, DOE-TES\SBR Joint Investigators Meeting, Apr 28-29, Potomac, MD.

4. Mishra, U., and W.J. Riley. 2015. Scaling impacts on environmental controls and spatial heterogeneity of soil organic carbon stocks, 5th North American Carbon Program PI meeting, Jan 26-29, Washington DC, USA.

5. Mishra, U., W.J. Riley, and C.D. Koven. 2014. On spatial scaling and environmental controls of soil organic carbon stocks, American Geophysical Union, San Francisco, California, USA.

6. Hugelius, G., J. Strauss, S. Zubrzycki, J. W. Harden, E.A. G. Schuur, C-L. Ping, L. Schirrmeister, G. Grosse, G. J. Michaelson, C. D. Koven, J.A. ODonnell, B. Elberling, **U. Mishra,** P. Camill, Z. Yu, J. Palmtag, and P. Kuhry. 2014. Improved estimates show large circumpolar stocks of permafrost carbon while quantifying substantial uncertainty ranges and identifying remaining data gaps, American Geophysical Union, San Francisco, California, USA.

7. Mishra, U., J.D. Jastrow, R.M. Matamala, Z. Fan, B. Drewniak, W.J. Riley, and J. Krummel. 2014. Spatial representation of soil properties in earth system models, 20th World Congress of Soil Science, June 08-13, Jeju, South Korea.

8. Torn, M.S, L. J. Smith, **U. Mishra,** D. Sanchez, and J. Williams. 2014. Ecological limits to terrestrial biological carbon dioxide removal, American Geophysical Union, San Francisco, California, USA.

9. Jastrow J.D., R. Matamala, Z. Fan, **U. Mishra,** R.M. Miller, C.L. Ping, G.J. Michaelson, F.J. Calderon, A. Kholodov, and V. Romanovsky. 2014. Argonne terrestrial ecosystem science SFA: Soil carbon response to environmental change, DOE-TES\SBR joint PI meeting, May 6-7, Potomac, MD.

10. Drewniak, B., and **U. Mishra**. 2014. Soil organic carbon response to cultivation in the Community Land Model, RCN FORECAST workshop, June 11-14, Breckenridge, CO.

11. Mishra U., W.J. Riley, and C.D. Koven. 2013. Topographic controls, spatial heterogeneity, and prediction accuracies of SOC stocks across geospatial and earth system models, Soil Science Society of America, Tampa, Florida, USA.

12. Drewniak B., and U. Mishra. 2013. Modeling agriculture impacts on soil organic carbon under different management practices with the Community Land Model, American Geophysical Union, San Francisco, California, USA.

13. Mishra U., W.J. Riley, and C.D. Koven. 2013. Environmental controls, and prediction accuracy of soil organic carbon stocks across geospatial and earth system models, 4th NACP All-investigators Meeting Feb 4-7, Albuquerque, New Mexico, USA.

14. Mishra U., J.D. Jastrow, R. Matamala, G. Hugelius, C.L. Ping, and G.J. Michaelson. 2013. Spatial variability of surface organic horizon thickness across Alaska, American Geophysical Union, San Francisco, California, USA.

15. Mishra U., W.J. Riley, and C.D. Koven. 2012. Assessment of spatial heterogeneity, environmental controls, and prediction accuracy of soil organic carbon stocks across geospatial and earth system models, American Geophysical Union, San Francisco, California, USA.

16. Mishra U., and W.J. Riley. 2012. Active-layer, permafrost, and whole-profile depth variability of Alaskan soils. Fifth Global workshop of Digital Soil Mapping, Apr 10-13, Sydney, Australia.

17. Nave L., C. Swanston, U. Mishra, and K. Nadelhoffer. 2012. Afforestation Effects On Soil Carbon Storage: An Assessment for the United States Based On Meta-Analysis, Stable Isotopes, and a Geospatial Soil Carbon Database, Soil Science Society of America, Cincinnati, Ohio, USA.

18. Torn M.S., D.P. Billesbach, J. Bradford, C. Zou, **U. Mishra**, M.L. Fischer, S. Gunter. 2011. The effects of converting marginal lands to switchgrass on carbon, water and energy fluxes. AmeriFlux Science Meeting & 3rd NACP All-investigators Meeting Jan 31-Feb 4, New Orleans, LA.

19. Thornton P., W.J. Riley, N. McDowell, J.T. Randerson, F.M. Hoffman, X. Yang, M. Post, **U. Mishra,** C.D. Koven, C. Xu, and R. Fisher. 2011. Reducing uncertainties associated with terrestrial carbon cycle-climate system feedbacks: Improved Earth System model

process representation for arctic, tropical and temperate systems - Annual meeting DOE, Office of Biological and Environmental Research, Climate and Erath system modeling, Sept 19-22, Washington D.C., USA.

20. Mishra U., and W.J. Riley. 2011. Spatial variability of active layer depth and organic carbon stocks of Alaska, Annual meeting DOE, Office of Biological and Environmental Research, Climate and Erath system modeling, Sept 19-22, Washington D.C., USA.

21. Mishra U., and W.J. Riley. 2011. Spatial variability of soil depth and organic carbon stocks of Alaska, American Geophysical Union, San Francisco, California, USA.

22. Mishra U., M.S. Torn, and K. Fingerman. 2010. Adoption of Miscanthus on US croplands: impacts on soil organic carbon and water, American Geophysical Union, San Francisco, California, USA.

23. Horvath A., E. Masanet, T. McKone, A. Lobscheid, **U. Mishra**, K. Fingerman, T. Lipman, and M. Auffhammer. 2010. Large-scale advanced biofuel implementation: A case study of Illinois and Indiana, 239th American Chemical Society National meeting, March 21-25, San Francisco, CA, USA.

24. Mishra U., and M.S. Torn. 2010. An improved method for estimating regional soil carbon sequestration: combining IPCC carbon inventory method and geostatistics, 9th Annual Berkeley Atmospheric Sciences Symposium, Berkeley, California, USA.

25. Mishra U., and M.S. Torn. 2010. Potential Miscanthus productivity on croplands of US, UC Berkeley Energy Symposium, Berkeley, California, USA.

26. Lobscheid A.B., E. Masanet, **U. Mishra**, A. Barrett, B. Strogen, C. Scown, A. Horvath, and T.E. McKone. 2010. Sustainable biofuels: Life cycle assessment of health impacts, UC Berkeley Energy Symposium, Berkeley, California, USA.

27. Mishra U., R. Lal, and M.S. Torn. 2009. Effect of landuse change on soil organic carbon pool in Midwestern U.S., Soil Science Society of America, Pittsburgh, Pennsylvania, USA.

28. Mishra U., R. Lal, D. Liu, and B. Slater. 2008. Evaluation of the predictors of soil organic carbon stock at a regional scale, Soil Science Society of America, Houston, Texas, USA.

29. Mishra U., R. Lal, B. Slater, F. Calhoun, and D. Liu. 2007. Prediction and mapping of soil organic carbon stock using pedometrical techniques at regional scale, Soil Science Society of America, New Orleans, Louisiana, USA.

30. Mishra U., D. Clay, and T. Trooien. 2005. Using remote sensing based Evapotranspiration maps to assess soil and crop yield variability, International conference of Pedometrics, Naples, Florida, USA.

TRAINING/WORKSHOPS

1. "DAYCENT/CENTURY ecosystem modeling". Training participant organized by Natural Resource Ecology Laboratory, Colorado State University, Fort Collins, CO, Apr 5-9, 2010.

2. "Characterizing soil carbon in Permafrost regions and its vulnerability to climate change" Invited participant, organized by Argonne National Laboratory, Chicago, IL, Feb 14-15, 2011.

3. "Pre-conference digital soil mapping intensive training" training participant organized by University of Sydney, Australia, Apr 4-5, 2012.

4. "Data-Model Needs for Belowground Ecology" Invited participant, organized by Department of Energy, Terrestrial Ecosystem Science, Washington DC, May 8, 2014.

5. "Model-Data Integration: Modeling Frameworks, Data Management and Scientific Workflows" Invited participant, organized by Department of Energy, Subsurface Biogeochemical Research, Washington DC, Apr 30- May 1, 2015.

PROFESSIONAL AFFILIATIONS

- Pedometrics, International Union of Soil Science since 2004.
- Soil Science Society of America since 2006.
- International Working Group on "Digital Soil Mapping" since 2008.
- American Geophysical Union since 2009.
- International Soil Carbon Network since 2009.
- American Association for the Advancement of Science since 2009.
- Permafrost Carbon Research Collaboration Network since 2011.